



Evaluation of Approval Request / Call for Release Procedures at Charlotte Douglas International Airport

DASC

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Lindsay Stevens, Lynne Martin, Kimberly
Jobe, Bonny Park, Eric Chevalley, Hanbong
Lee, Savita Verma, Victoria Dulchinos

Outline



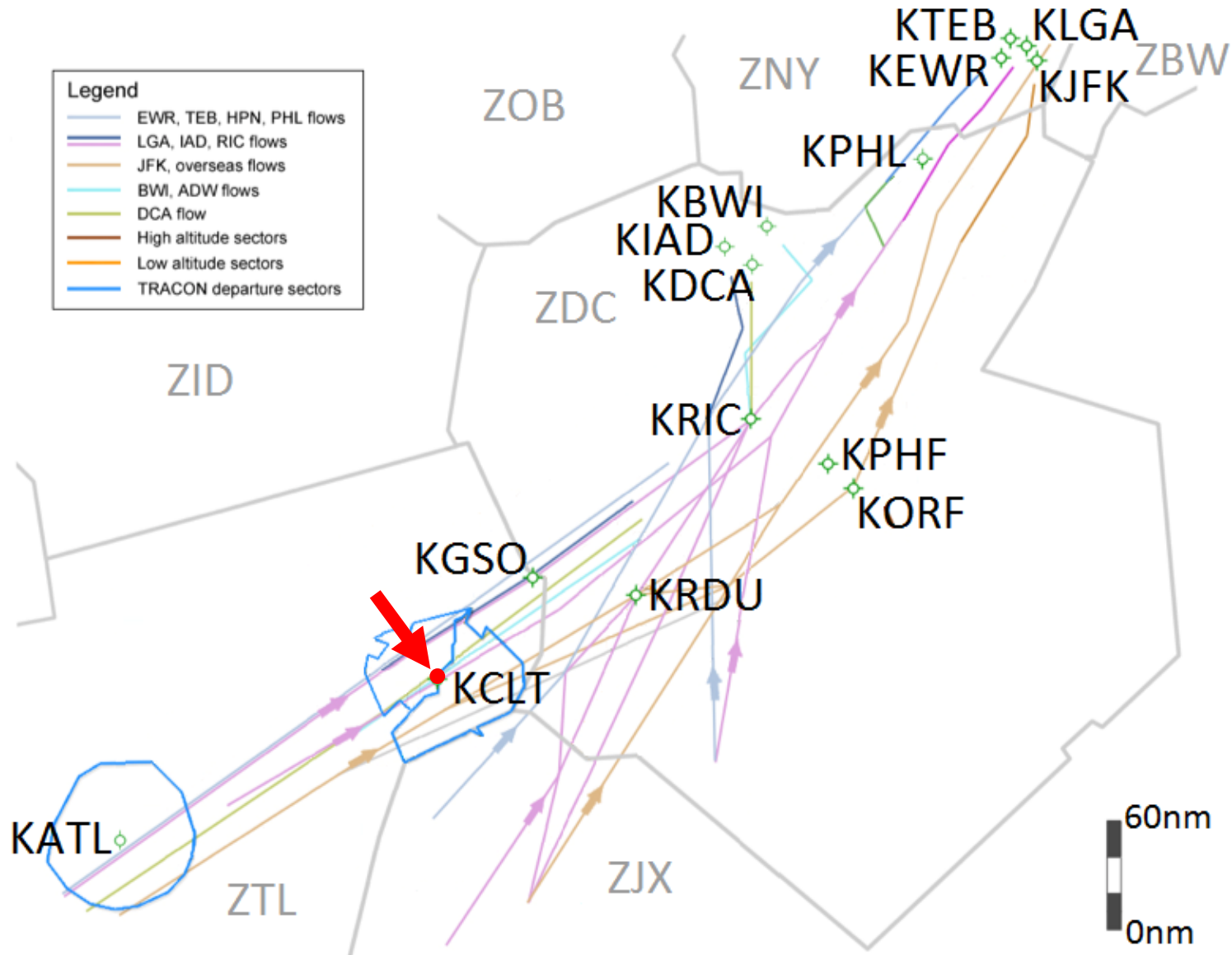
- The Challenge
- Operations
- Simulation Details
- Findings
- Summary

The Challenge



- Air traffic capacity and demand imbalances result in congestion and delays
- Traffic Management Initiatives (TMIs)
 - Strategic: e.g., Ground Delay Programs or Airspace Flow Programs
 - Tactical: e.g., Approval Request (APREQ) / Call for Release (CFR)
- TMIs can result in flow control times
 - Expect Departure Clearance Time (EDCT)
 - APREQ/CFR release time

Charlotte Douglas International Airport (CLT) and Surrounding Airspace



Previous Analysis



- A benefits analysis of CLT's 2014 operations
- TMI compliance = measure of predictability

TMI Compliance		
TMI	CLT	Nation-wide
APREQ only	42.9%	54.4%
EDCT only	56.8%	46.9%
APREQ when flight has both APREQ+EDCT	~42.9%	---
EDCT when flight has both APREQ+EDCT	52.0%	---

APREQ/CFR Users



TOWER



TERMINAL



RAMP

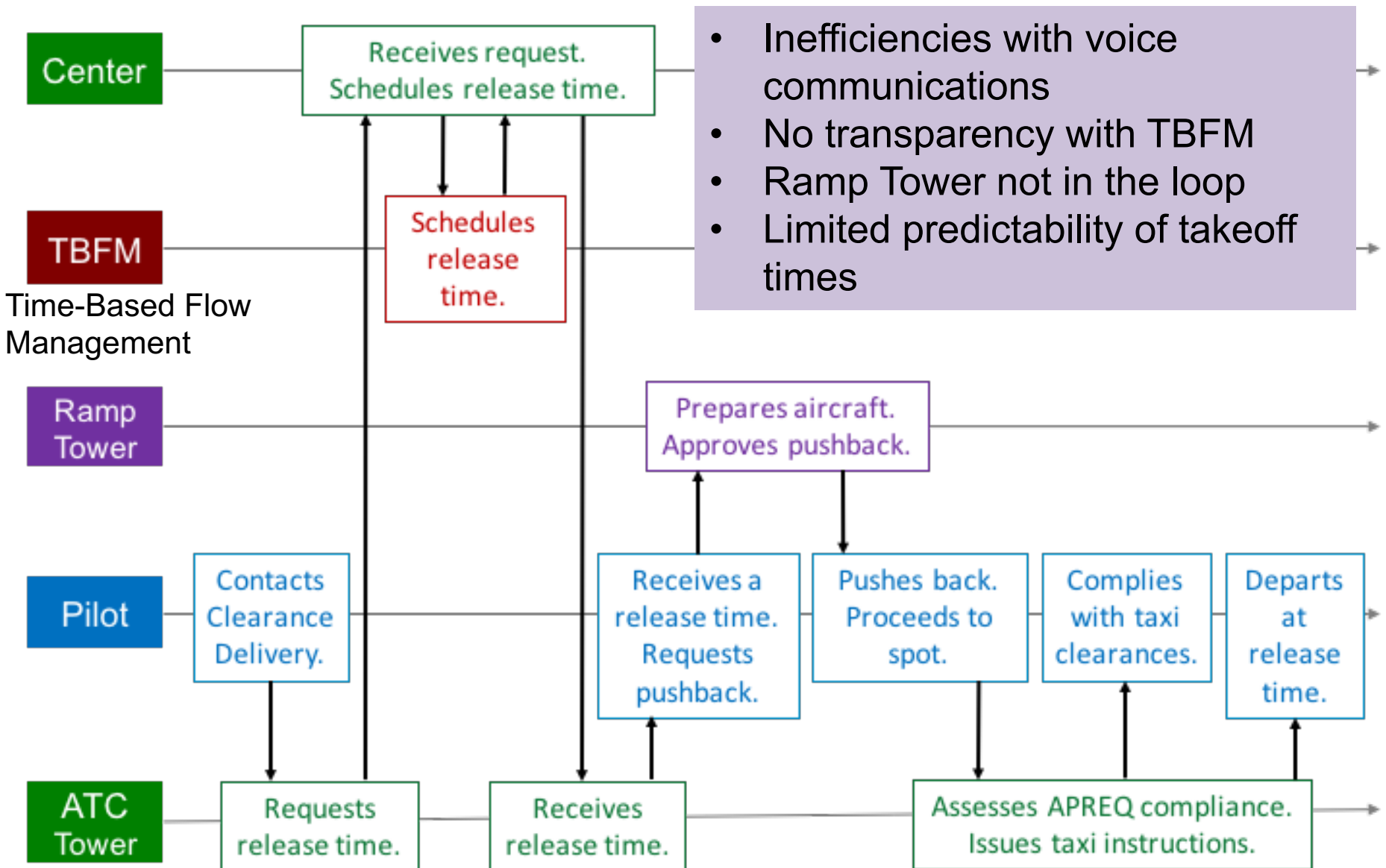


PILOTS

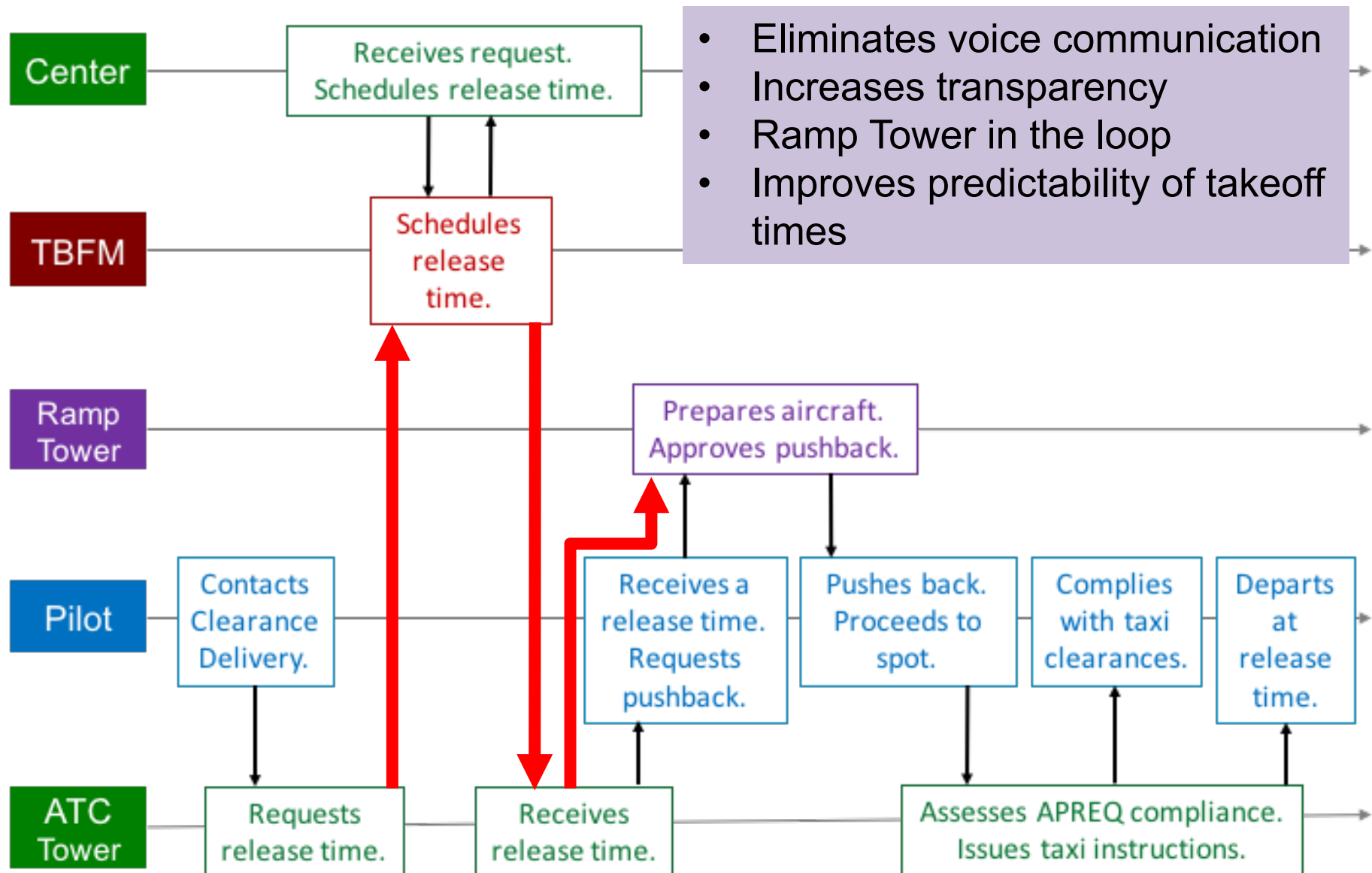


CENTER

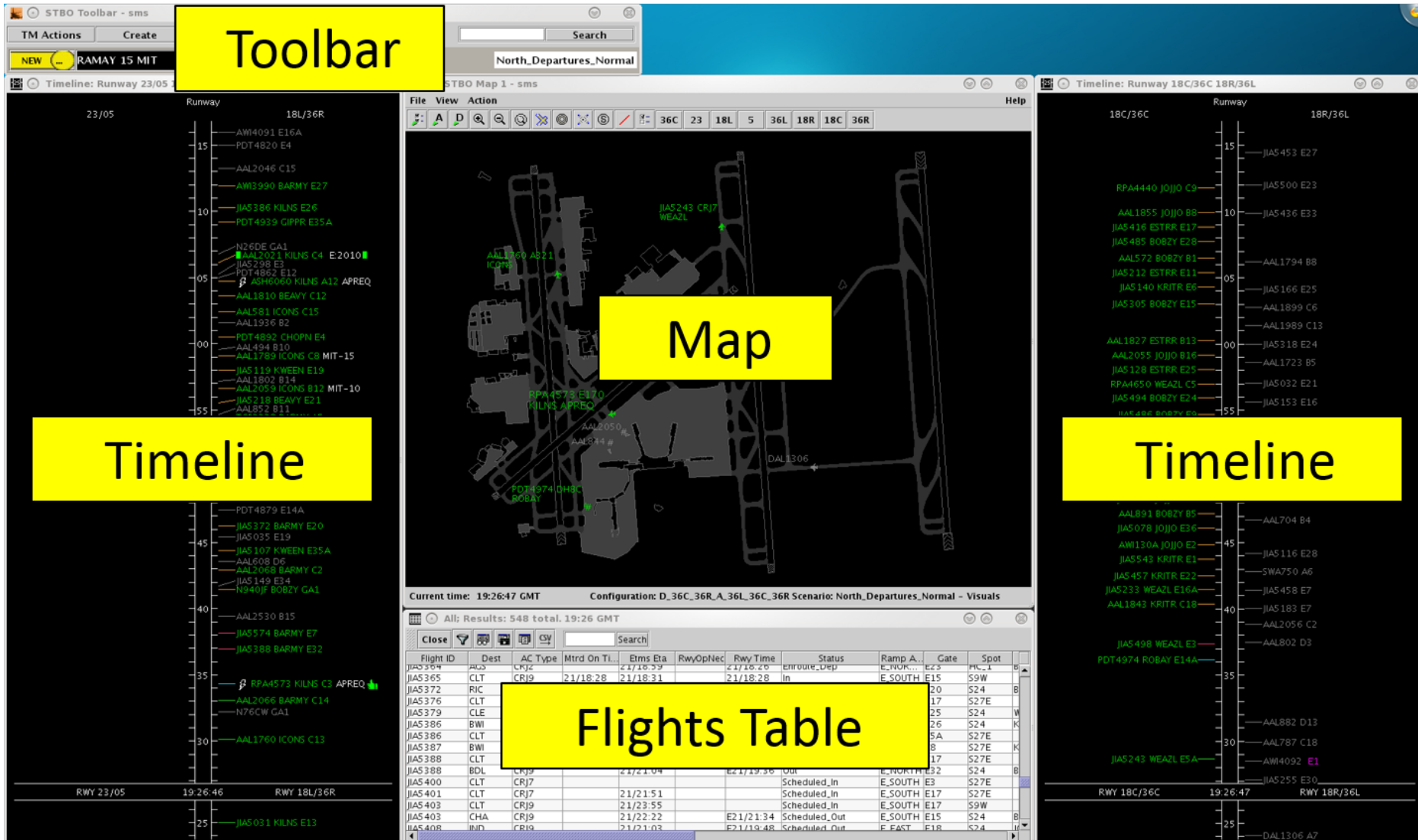
Current Day APREQ/CFR Procedures



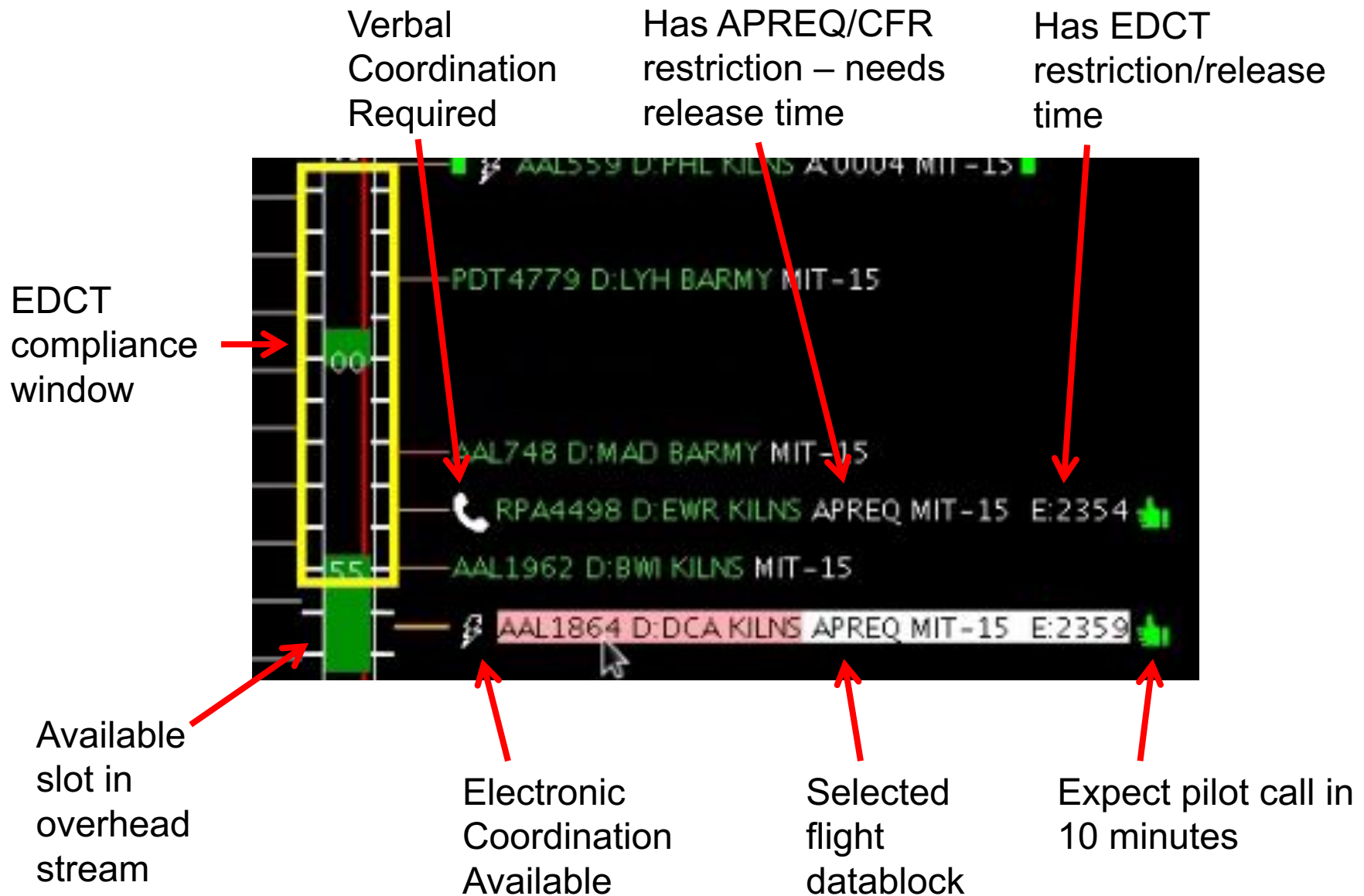
New: APREQ Electronic Coordination



Surface Trajectory Based Operations (STBO) Client



Elements of User Interface Timeline



Compliance Indicators



- Inside of compliance window (on time)



- Outside of compliance window and early



- Outside of compliance window and late





Human-in-the-Loop (HITL) Simulation

HITL Objectives



- Evaluate the new APREQ/CFR procedures
- User feedback on electronic APREQ coordination

Participants



- Two active CLT Traffic Management Coordinators (TMCs) and two active CLT Front Line Managers (FLMs)
 - All four rotated through one HITL CLT TMC position
- Four Tower controllers, one clearance delivery (CD)
 - All were retired ATC confederates
- Four confederate pseudo-pilots

Simulation Environment



TMC Station



Traffic Scenario in CLT



- South Dual Converging Operation
 - 92 arrivals & 80 departure per hour
- Triple North Operation
 - 75 arrivals & 65 departures per hour
- No wind, clear visibility, but IFR in effect
- No General aviation flights
- No Cargo flights
- Duration 60 min
- 6-8 APREQ flights, 6 EDCT flights

Tower TMC Procedures

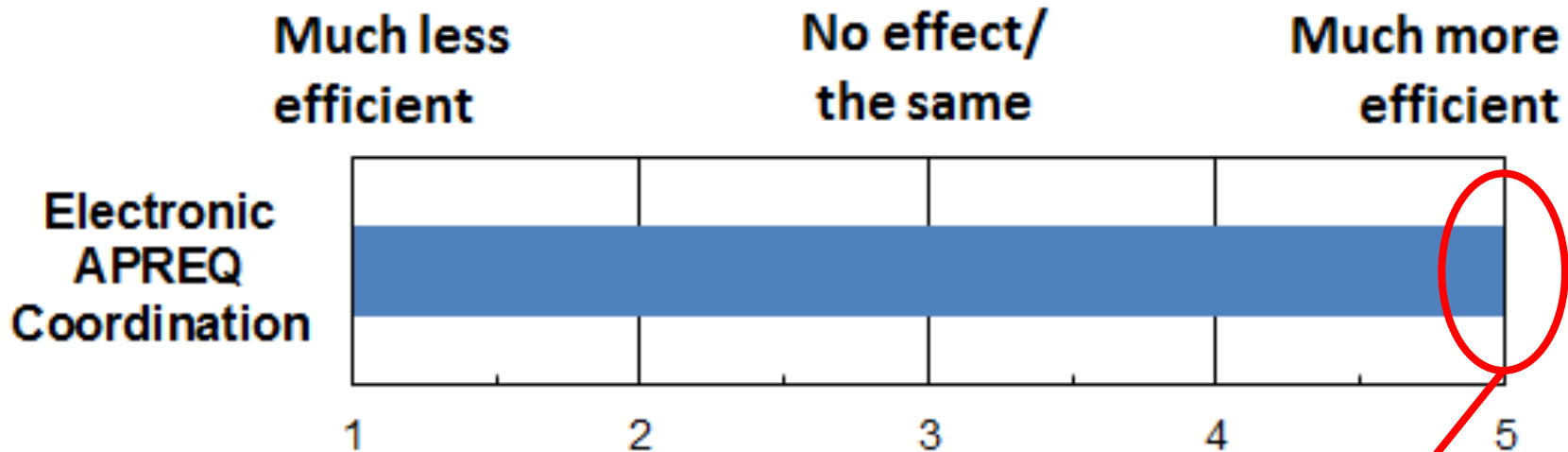


- Work the traffic as they would in the field
 - Try to maximize throughput while ensuring safety
 - Launch aircraft with APREQ or EDCT times on time
- Use electronic coordination to obtain APREQ release times when able



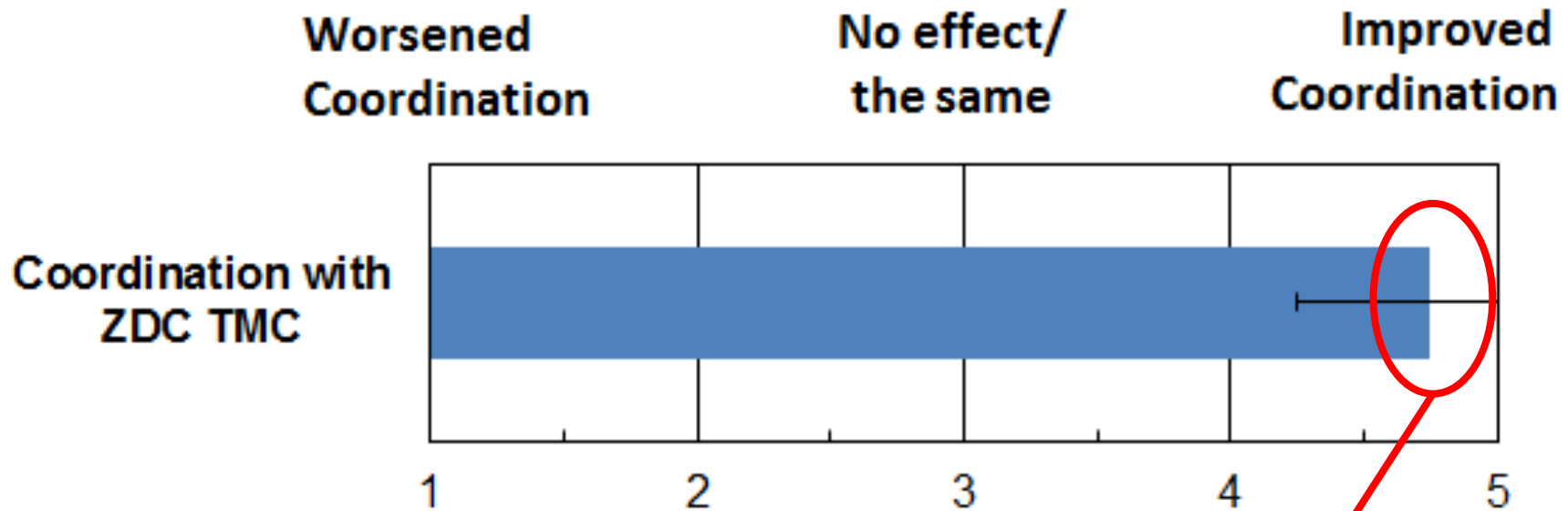
Findings

Comparing Electronic Coordination with Current Day Procedures



Electronic coordination was rated as more efficient than current day APREQ/CFR procedures.

Comparing Electronic Coordination with Current Day Procedures



Participants preferred electronic coordination over current day APREQ/CFR procedures.

APREQ/CFR and EDCT Compliance



- 24 total APREQ/CFR flights took off
 - Nine of the 24 also had EDCTs

TMI Compliance for HITL		
TMI	On time	Out of compliance, but <i>early</i>
APREQ only	9	6
APREQ when flight has both APREQ+EDCT	3	6
EDCT when flight has both APREQ+EDCT	4	5

No flights departed later than APREQ or EDCT release time windows

User Feedback



- Improve APREQ and EDCT compliance indicators
- Remove “thumbs up” ready icon
- Audible alerts
- Exclude individual flights from TMIs
- Adjust acknowledgement procedures

Changes have since been made in the STBO Client to address this feedback.



Summary

Summary



- STBO Client electronic coordination trends:
 - More efficient
 - Improved coordination with ZDC
- TMI compliance trended toward improving
 - No aircraft released late
- Demonstration of new procedures at CLT beginning Fall of 2017



Thanks for your attention!

Lindsay.stevens@nasa.gov